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ABSTRACT

A review of the literature indicates that measures of the McClelland-Atkinson need-Achievement (nAch) construct are weak in terms of both reliability and validity. The most serious weakness of the model's validity is the lack of evidence for the hypothesized positive relationship between nAch and performance. In addition, the inverse relationship between the probability of success and the incentive value of success is not supported. The nAch model is shown to be closely related to expectancy theory. The success of the nAch construct in predicting risk preference is explained with an analysis of the information obtainable by attempting tasks of different probabilities of success. Moderate risks are shown to offer maximum information, whereas tasks of high or low risk offer minimum information. Hence, what has been termed "need Achievement" is reconceptualized as the willingness to seek information about one's own performance capacity. This, in turn, is related to processes of social comparison. Information on academic performance must be presented in such a way as to minimize threats to the student's self-esteem. The analysis is related specifically to individualization of instruction and integration of classrooms.
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THEORETICAL PAPER NO. 42

A REANALYSIS OF THE NEED TO ACHIEVE AND ITS RELATIONSHIP TO EDUCATION

REPORT FROM THE PROJECT ON
CHILDREN'S LEARNING AND DEVELOPMENT

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A REANALYSIS OF THE NEED TO ACHIEVE AND
ITS RELATIONSHIP TO EDUCATION

by

Richard Marliave

Report from the Project on
Children's Learning and Development

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Statement of Focus

Individually Guided Education (IGE) is a new comprehensive system of elementary education. The following components of the IGE system are in varying stages of development and implementation: a new organization for instruction and related administrative arrangements; a model of instructional programming for the individual student; and curriculum components in prereading, reading, mathematics, motivation, and environmental education. The development of other curriculum components, of a system for managing instruction by computer, and of instructional strategies is needed to complete the system. Continuing programmatic research is required to provide a sound knowledge base for the components under development and for improved second generation components. Finally, systematic implementation is essential so that the products will function properly in the IGE schools.

The Center plans and carries out the research, development, and implementation components of its IGE program in this sequence: (1) identify the needs and delimit the component problem area; (2) assess the possible constraints—financial resources and availability of staff; (3) formulate general plans and specific procedures for solving the problems; (4) secure and allocate human and material resources to carry out the plans; (5) provide for effective communication among personnel and efficient management of activities and resources; and (6) evaluate the effectiveness of each activity and its contribution to the total program and correct any difficulties through feedback mechanisms and appropriate management techniques.

A self-renewing system of elementary education is projected in each participating elementary school, i.e., one which is less dependent on external sources for direction and is more responsive to the needs of the children attending each particular school. In the IGE schools, Center-developed and other curriculum products compatible with the Center's instructional programming model will lead to higher student achievement and self-direction in learning and in conduct and also to higher morale and job satisfaction among educational personnel. Each developmental product makes its unique contribution to IGE as it is implemented in the schools. The various research components add to the knowledge of Center practitioners, developers, and theorists.

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Abstract

A review of the literature indicates that measures of the McClelland-Atkinson need-Achievement (nAch) construct are weak in terms of both reliability and validity. Whereas score-rescore and interrater reliabilities are reasonable, test-retest reliability (stability) is poor. This indicates that nAch reflects situational variables rather than enduring personality variables. The validity of the model is upheld only in terms of risk-taking relationships wherein persons high in nAch prefer tasks of intermediate risk (probability of failure or success). The most serious weakness of the model's validity is the lack of evidence for the hypothesized positive relationship between nAch and performance. In addition, the inverse relationship between the probability of success and the incentive value of success was not supported.

The nAch model is shown to be closely related to expectancy theory. Theories of locus of control and attribution are found to be useful in understanding the need for achievement. The success of the nAch construct in predicting risk preference is explained with an analysis of the information obtainable by attempting tasks of different probabilities of success. Moderate risks are shown to offer maximum information, whereas tasks of high or low risk offer minimum information. Hence, what has been termed "need Achievement" is reconceptualized as the willingness to seek information about one's own performance capacity. This, in turn, is related to processes of social comparison.

The basic implication for education of this reanalysis of the need for achievement is that information on academic performance must be presented in such a way as to minimize threats to the student's self-esteem. The analysis is related specifically to individualization of instruction and integration of classrooms.

Introduction

Education is dependent upon an interaction between the opportunities offered by a school and the abilities and motivation that the student brings to that school. Of the three variables, opportunity, ability, and motivation, the most stable is ability. There is a tremendous range of opportunities that can be provided for any child, and that child can vary enormously from day to day in the extent to which he avails himself of those opportunities. The present discussion, therefore, will be concerned with the third variable, motivation. The interpretation of achievement motivation which is developed from this investigation will then be analyzed in terms of its educational implications.

Motivation is usually conceived as consisting of the "what" and "how long" of behavior. Hebb (1949) suggests that the term motivation refers to the persistence or stability ("how long") of an organized phase sequence (behavior) in maintaining a given direction or content ("what"). Atkinson and Feather (1966) view achievement motivation as the strength ("how long") of a tendency to undertake (behavior) some achievement-oriented activity ("what"). It is logical to assume that persistence ("how long") is primarily dependent upon content ("what"), in that for a given individual, effort generally depends upon the nature of the task. The relation between persistence and task has been thoroughly investigated. However, most research has treated task as a constant, neglecting the process of task selection. Persistence itself can be interpreted in terms of task selection, in that the choice of persisting at a given task can be conceived as a selection of that task. The present paper, therefore, will interpret achievement motivation in terms of the variables which underlie the individual's determination of what he will attempt to achieve.

One of the most prominent bodies of research on achievement motivation centers around the concept of "need Achievement" (nAch), developed by McClelland (McClelland, Atkinson, Clark, & Lowell, 1953) and Atkinson (Atkinson & Feather, 1966). This theoretical construct will serve as the focal point of the present discussion because of both its prominence in the literature on motivation and its utility for investigating the process of task selection. The development and nature of the nAch construct will be reviewed. Other bodies of theory will then be related to this construct as aids in the development of the present interpretation of motivation. "Expectancy" will be considered as a fundamental component of nAch, preceding nAch in terms of historical development. "Locus of control" will be analyzed as a possible added dimension of achievement motivation. Weiner's (1970) attributional analysis will be shown to relate locus of control to achievement motivation. Constructs of "information analysis" and "social comparison" will be invoked in a final analysis of the process of task selection as it relates to achievement motivation. The relevance of this interpretation to existing educational policy will then be considered. Among the educational policies to be examined are evaluation, individualization, and classroom integration.

The nAch Construct

McClelland, Atkinson, and their associates have developed theories to explain, and instruments to measure, the "needs" for achievement, for affiliation, and for power. We will be concerned here with the need for achievement (nAch). In 1948 David McClelland and his co-workers began to develop an instrument for assessing nAch as it is expressed in free association under conditions whereby the

strength of motivation is experimentally controlled. Free-associative thought was elicited in the form of fantasy stories given by individuals in response to pictures of the Thematic Apperception Test (TAT). This technique was adapted from the earlier work of Henry Murray (Atkinson, 1964). Experimentation had shown that need for achievement was better reflected in fantasy measures than in perceptual indices (McClelland, Atkinson, & Clark, 1949a; McClelland, Clark, Roby, & Atkinson, 1949b). The refinement, validation, and experimental analysis of nAch, as both an instrument and a construct, has continued to the present.

The procedure whereby the measurement techniques were originally developed and are presently used is illustrated by one of the early McClelland studies of nAch (McClelland et al., 1949b). Over 200 male college students wrote stories in response to pictorial representations of achievement-related situations. The achievement orientations of the subjects were experimentally manipulated with explanations given for the purposes and outcomes of several short pencil-and-paper tests administered to subjects prior to the story responses. Six achievement-orientation conditions were experimentally established, but only four of these could be used. Stories were analyzed completely for 39 Ss from each of the four conditions: (a) Relaxed: the paper-and-pencil tests were interpreted as being in an experimental stage; (b) Neutral: tests were described as experimental, but Ss were urged to do their best; (c) Failure: tests were interpreted as standardized measures of intelligence and leadership, and Ss wrote their stories after being told that they had failed on these measures; (d) Success-Failure: the procedure was the same as the failure condition except that Ss succeeded on the first part of the "intelligence and leadership" tests and then failed on the whole test. The fifth condition (Achievement-Oriented) received the "ego-involving" instructions for the tests, describing them as measures of intelligence and leadership, but were not told of any outcomes. Stories from this group were considered too inhibited to analyze. The results for the sixth condition (Success) were not reported because the meaning of the situation to the Ss did not seem clear.

The nAch score is based on items (rated features of stories) which differed according to the condition under which the stories were elicited. The three basic rating categories for items were unrelated imagery, scored -1; doubtful imagery, scored 0; and achievement imagery, scored +1. Achievement imagery items were broken down further into various

subcategories. The two major subclasses were items which dealt with "some long-term problem of getting ahead at the ego ideal level (career, schooling, inventing something, etc.)" and items involving a "specific task situation" (McClelland et al., 1949b, pp. 244-245).

Most evidence indicates that this technique for measuring nAch provides reasonably high scoring reliabilities. The study discussed above (McClelland et al., 1949b) reported a correlation of .95 between nAch scores judged by two raters working together on two different occasions a month apart. The average score-rescore reliability for the various subcategories was .91. Atkinson reported a reliability of .95 for nAch scores rated on two occasions six months apart. The score-rescore reliability for subcategories was .85. Furthermore, McClelland et al. (1953) have reported an interrater reliability of .96 for total scores and .78 for subcategories, using one experienced rater and one inexperienced rater. Published studies of nAch through 1958, including many studies outside the McClelland group, have demonstrated a median reliability of .89 (Atkinson, 1964).

Test-retest reliability, based on two different sets of fantasy reports given by the same subject, is not so high. Lowell (McClelland et al., 1953) reported an insignificant reliability of .22 for stories obtained only a week apart. Atkinson (McClelland et al., 1953) obtained a reliability of .64 for different sets of TAT pictures administered at the same time. These results indicate either an enormous instability of nAch as a feature of personality or the intervention of confounding variables into the testing situation. Maehr and Sjogren (1971) suggest that subtle environmental cues present during different picture administrations may have strong effects on S responses. Reitman and Atkinson (1958) and McClelland et al. (1953) suggest that Lowell's initial TAT picture administration may have had testing effects which caused the divergent results on the second administration. The authors also point out that there was 72.5% agreement between the first results and the retest a week later in terms of placing Ss above or below the median. This compares favorably with the same index of agreement (78.1%) calculated for Atkinson's simultaneous retest data which had yielded a .64 reliability. The reliability of placement above or below the median indicates that the technique is reasonably stable in measuring nAch for groups as opposed to individuals (McClelland et al., 1953). Nevertheless, the instability of nAch for individuals seems to preclude its use as an index of any personality feature. With only rare exceptions (e.g., Haber & Alpert, 1958) the

literature has shown either low or nonsignificant nAch test-retest correlations, indicating that the underlying variable is not stable (Klinger, 1966).

Entwistle (1972) contends that the nAch technique yields a low internal reliability. Explaining the application of measures of internal consistency to nAch data, Entwistle presents her own data and reanalyzes data from other studies. She concludes that the internal reliability of nAch ranges from .30 to .40. For example, the McClelland et al. (1953) study discussed above is reanalyzed for internal consistency, yielding a reliability estimate of .37. Entwistle contends that the lack of predictive validity of nAch can be attributed to this low internal consistency.

A final and crucial consideration in understanding the nAch construct is its validity. Prefatory to an examination of data relevant to the validity issue, the conceptual theory involved will be reviewed briefly. Atkinson and Feather (1966) describe the tendency to engage or not to engage in an activity, (T_a), as a product of three variables: motive, expectancy, and incentive. "Motive" involves the need for achievement, or nAch. "Expectancy" is the subjective probability of success; while "incentive" is the value of success at the given activity. The product of these variables determines the "tendency to achieve success," (T_s). One will tend to achieve success if he wants to achieve (motive) and believes that he can achieve (expectancy) a worthwhile goal (incentive). The converse of the tendency to achieve success is the "tendency to avoid failure," ($T-f$). In addition, Atkinson throws in a sort of error term, "extrinsic motivational tendencies," ($Text$). These consist of tendencies to engage in the relevant activity for reasons not involving concern for achievement. Atkinson and Feather (1966) summarize the theory with the following formulas:

$$(T_a) = (T_s) + (T-f) + (Text) \text{ where,}$$

$$(T_s) = (M_s) \times (P_s) \times (I_s) \text{ and}$$

$$(T-f) = (M_f) \times (P_f) \times (I_f)$$

where (M_s) is the need for success,
 (P_s) is the probability of success,
 (I_s) is the incentive value of success,
 (M_f) is the motive to avoid failure,
 (P_f) is the probability of failure,
 and (I_f) is the incentive value of failure.

The validity of this construct will be examined here in terms of three of its hypotheses. First, the theory proposes that (T_s) is strongest with an intermediate (P_s), but that the significance of this principle will be substantial only when (M_s) is strong. This relationship is illustrated in Figure 1. A second hypothesis

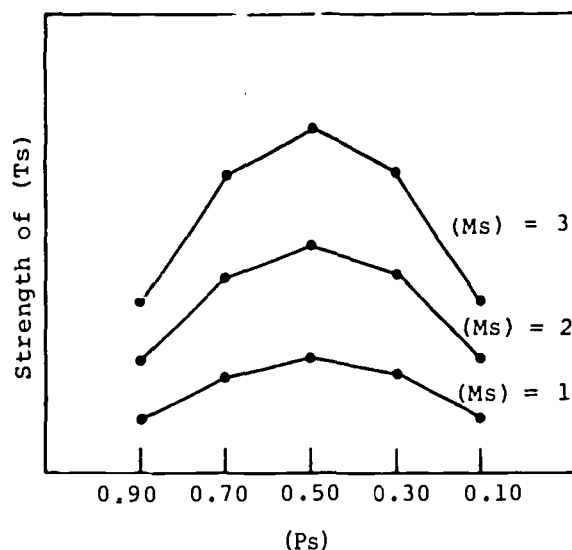


Figure 1. Graphic representation of the relationship between (T_s), (P_s), and (M_s), assuming that $(T_s) = (M_s) \times (P_s) \times (I_s)$ and $(I_s) = 1 - (P_s)$, for (M_s) = 1, 2, or 3.

Source: Atkinson and Feather, 1966, p. 329.

is that (I_s) = $1 - (P_s)$. That is, the incentive value of success is inversely related to the probability of success. The third hypothesis is that these variables will be related to performance. (T_a) is said to relate positively to performance except when it reaches very high levels. The other variables relate to performance according to how they combine to produce (T_a). This suggests that an intermediate (P_s) and a high (M_s) will usually facilitate performance. When (T_a) approaches the excessively high level, a high (M_f) results in improved performance because the level of (T_a) is moderated. (The index of (M_f) is usually a measure of test anxiety.)

The proposition that (T_s) will be strongest at intermediate levels of (P_s) and high levels of (M_s) implies that persons who are high in (M_s) will tend to prefer tasks of intermediate (P_s) (Atkinson & Feather, 1966). That is, individuals high in nAch should prefer challenging tasks. Most of the empirical data tend to support this proposition. This appears to be true both for competitive situations (Litwin, 1966; McClelland, 1958) and noncompetitive situations (Moulton, 1965). Maehr and Sjogren (1971), in a review of the literature, agree that the data show "achievement-oriented" Ss ($(M_s) > (M_f)$) to prefer intermediate levels of risk more than do "failure-threatened" Ss ($(M_s) < (M_f)$).

However, these writers contend that even failure-threatened *Ss* show a slight preference for tasks of intermediate risk. Moreover, Smith (1966) reports evidence that this risk-preference difference decreases as a function of increasing age. Nevertheless, the Atkinson model seems reasonably valid in terms of risk preferences.

The hypothesis that the incentive value of success is inversely related to the probability of success, $(Is) = 1 - (Ps)$, has not received nearly the attention that the first hypothesis has. Nevertheless, at least one experiment supports this relationship. Litwin (1966) asked one group of *Ss* for estimates of (Ps) in terms of accuracy in a ring-toss game. He also obtained reports from different *Ss* as to how large a monetary prize should be offered for success at different levels of accuracy. These reports were used as estimates of the incentive value of success, (Is) . The results support the hypothesis that (Ps) and (Is) are inversely related. However, the data lack generalizability. Litwin examined other hypotheses in the same experiment, using a variety of games, but considered the ring toss to be the only game for which estimates of incentive value were appropriate. One cannot assume that data based on a ring-toss game will apply to nonathletic tasks, such as academic achievement.

The validity of the model in relation to performance is not conclusive. This, of course, is a crucial issue. It is difficult to conceive of an adequate model of motivation that has no consistent relation to performance. Atkinson (1964) refers to a review of studies in McClelland et al. (1953) and a study by Lowell (1952). With brief discussion of the issue, Atkinson concludes that high nAch scores are related to performance. However, an examination of the "review" in McClelland et al. (1953) reveals only two studies, one of these being the Lowell (1952) study. The first study is described by McClelland et al. as "interesting but hardly conclusive" (1953, p. 229). This leaves us with just Lowell's data as evidence. However, Lowell measured performance in terms of anagram productivity and simple addition problems, using college students as *Ss*. It is probable that these tasks were excessively simple, such that nAch is related here to persistence rather than performance. McClelland et al. do go on to review other literature investigating the relationship between nAch and college grades. However, they concede at the outset that grades do not necessarily reflect performance, while conceding at the close that there is no consistent relation between nAch and grade-point average (GPA).

Maehr and Sjogren (1971), reviewing the

literature, find no consistent relation between nAch and performance. Another review of the literature, by Klinger (1966), also fails to find a consistent relation between nAch and performance. Only 17 of 32 studies investigating the relation of nAch to "molar" measures of performance, such as grades, reported significant results. Moreover, only 11 significant results were found among 27 studies of the relation between nAch and "task-performance" involving various short tasks. Entwistle (1972) contends that even where relations with performance have been found, they can be attributed to the correlation of nAch with productivity and IQ because both of these variables correlate well with measures of performance. It must be concluded that the literature presents a fairly broad indictment of the hypothesized nAch-performance relationship.

A final note on the validity of the nAch model regards the function of extrinsic motivational tendencies, $(Text)$. This has been characterized as an "error term" because it is used to account for failure of the model to explain data, especially when an observed (Ta) is greater than the predicted (Ta) (Atkinson & Feather, 1966). Smith (1966) compared "extrinsic conditions" to relaxed and achievement-oriented conditions. Extrinsic conditions were established by avoiding any arousal of achievement motives, introducing only the extrinsic incentive of finishing the task quickly as a means of leaving earlier for dinner. It was found that the highest nAch scores were produced under extrinsic conditions. Smith concluded that nAch indices may reflect $(Text)$ as well as (Ms) . This suggests that nAch may involve a conglomerate of motives, achievement being only one. The moderately low internal consistency evidence discussed previously (Entwistle, 1972) supports the notion that extrinsic variables confound the measurement of nAch.

It must be concluded that the reliability and validity of the nAch model, after two decades of research, are in serious doubt. The literature on nAch reliability suggests reasonable score-rescore and interrater reliabilities. Test-retest reliability (stability), however, seems to be quite low. The nAch instrument also appears to have fairly low internal consistency. The validity of the model fares no better than the reliability of the instrument. Of the three hypotheses considered, only the risk-taking relationships appear valid. The inverse relationship between (Ps) and (Is) is without sufficient demonstration. Most serious is the deficient construct validity of the nAch model in terms of performance. In addition to the lack of evidence for the second and third

hypotheses, the validity of the model suffers from an excessive importance of extrinsic variables, (Text). It is appropriate, therefore, to examine other motivational constructs as additional resources for understanding the implications of achievement motivation for education.

Alternative Explanations of Achievement Motivation

Expectancy

The concept of expectancy has been important in psychological theory since the pioneering work of Kurt Lewin (1935). Expectancy is represented in the nAch model by the subjective probability of success, (Ps), (Atkinson & Feather, 1966). We have already seen that (Ps) plays a crucial role in hypothesized relationships based on the nAch model. This role has been profoundly influenced by earlier work on expectancy. Atkinson (1964, p. 235) in a discussion of the nAch model explains the "adoption of Tolman's concept of expectancy." The basic hypothesis that the tendency for goal-directed action is a joint function of the strength of the motive, (Ms), and of the expectancy for goal-attainment, (Ps), is said to have been adapted from Tolman.

The importance of this early expectancy theory is quite evident upon examination of the literature. Atkinson (1966, p. 330) has argued that the manipulability of expectancy of success was "relatively neglected in earlier studies which focus upon level of performance as the dependent variable." However, as early as 1937 Jucknat (Lewin, Tamara, Festinger, & Sears, 1944) reported the experimental manipulation of expectancy as a consequence of outcome. Lewin et al. (1944) conclude on the basis of research such as Jucknat's that the experience of success increases expectations, while failure results in lower expectations. Moreover, these authors have considered the components that underlie the determination of expectations, proposing relationships similar to those involved in the nAch model. Lewin et al. (1944, p. 376) suggest that the level of aspiration can be explained as a function of "the seeking of success, the avoiding of failure, and the cognitive factor of probability judgment." This sounds quite similar to Atkinson's notions of the "tendency to achieve success," the "tendency to avoid failure," and the "subjective probability of success" (or of failure).

Another important similarity between the nAch model and earlier expectancy theories is the postulation of an inverse relationship between (Ps) and (Is). Some theorists, such

as Rotter (1954), have described expectancy of success and value of success as independent variables. Lewin et al. (1944), however, recognize the inverse relationship assumed in the nAch model and empirically supported by Litwin (1966). Both the "attractiveness of an event" and the "probability of its occurrence as this is seen by him [the subject]" are discussed by Lewin (1944). An inverse relationship is described for the attractiveness (or "valence") and the probability of occurrence of an event.

The major difference between expectancy theory as formulated by Lewin and the nAch model is the former's emphasis on situational variables as opposed to the latter's emphasis on enduring personality traits. Lewin et al. (1944) are concerned with situations which lead the individual to seek success, fear failure, or prefer what is described as the more "realistic" 50-50 level of probability. Atkinson and Feather (1966), on the other hand, discuss achievement-oriented and failure-threatened personalities, wherein the achievement-oriented individual prefers "challenging" tasks of a 50-50 level of probability. The instability of the nAch instrument would seem to support Lewin's situational approach. However, it must be noted that the authors differ only in emphasis. Lewin et al. do give some consideration to personality differences, especially in terms of fear of failure, while both Atkinson (1958) and McClelland et al. (1953) analyze the influence of situational cues in the expression of achievement motivation.

Locus of Control

Given the relative congruency of expectancy theory and the nAch model, the more recent development of "locus of control" as an extension of expectancy theory should be related to the nAch model. Rotter (1966) discusses the locus of control concept in terms of "generalized expectancies for internal versus external control of reinforcement." Individuals display internal control when they perceive reinforcement as contingent upon their own behavior, rather than chance or some other uncontrollable, external variable. A sense of internal control is more likely to result in the generalization of reinforcement from one trial or task to another than is a sense of external control (Phares, 1957). Furthermore, the usual extinction patterns are reversed when internal control is perceived. That is, constant reinforcement is more difficult to extinguish than is intermittent reinforcement (James & Rotter, 1958). The theory is said

to apply both to situational and personality variables (Rotter, 1966). The situational cues in most of the research have been experimental instructions describing tasks in terms of either skill or chance. Personality variables have been studied with a variety of instruments, usually written-response scales (Crandall, Katkovsky, & Preston, 1962; Phares, 1957).

Theorists have suggested that locus of control and achievement motivation are related, predicting that SS high in internal sense of control will show greater achievement motivation (de Charms, 1968; Rotter, 1966). Studies have shown measured internality (locus of control) to be positively correlated with both nAch scores (Crandall et al., 1962) and behavioral indices of achievement motivation (Rotter, 1966). Correlations have been found with nAch scores derived from both TAT responses and written-response scales (Weiner & Kukla, 1970). The generality of these results is further enhanced by the fact that nearly every experiment uses a different scale of internality. The major limitation of the information of these data is that it is correlative. Nevertheless, the consistency of the locus of control-nAch relation is convincing.

Attributional Analysis

One of the more interesting analyses of the relation between locus of control and achievement motivation is the attributional analysis of Weiner (Weiner & Kukla, 1970; Weiner, Heckhausen, & Meyer, 1972).

Weiner's approach adds the dimension of stability to that of locus of control. This yields four bases of attribution: two stable variables, ability and task difficulty, and two unstable variables, effort and chance. These four variables can also be categorized according to locus of control, yielding the following matrix:

	internal control	external control
stable	ability	task difficulty
unstable	effort	chance

Weiner and his colleagues (1970, 1972) apply their attributional analysis to the nAch model in terms of four hypotheses. First, they contend that the achievement-oriented individual tends to attribute success to effort (an internal factor); this increases the reinforce-

ment value of the success, thereby enhancing the tendency to approach success in the future. This analysis is based on experiments showing that persons high in nAch attribute success to effort and that when outcomes are attributed to effort, the relative reward for success and punishment for failure are augmented (Weiner & Kukla, 1970). This occurs because people believe that effort should be rewarded more than ability.

The second hypothesis considered is the persistence of persons high in nAch. Weiner and Kukla (1970) found that individuals with high nAch attribute failure to a lack of effort. This is said to account for persistence following failure. Weiner et al. (1972) present data showing that attributions of failure to unstable variables, either lack of effort or chance, produce a lesser decrement in expectancy of success, (Ps), than do attributions of failure to stable factors (low ability or high task difficulty). That is, when people can explain their failure in terms of lack of effort or bad luck, they do not lower their expectations of future success as much as they would if inability or excessive task difficulty seemed to underlie the failure.

The third analysis involves the well-documented finding that persons high in nAch prefer tasks of intermediate difficulty. Weiner and Kukla (1970) hypothesize that individuals with high nAch prefer tasks of intermediate difficulty because these tasks yield more information about one's abilities. Success at an easy task or failure at a difficult task (the usual experiences with these tasks) give information concerning the task rather than the individual. This analysis is derived from data showing that self-attribution for success is inversely related to (Ps), while self-attribution for failure is positively related to (Ps). That is, self-attribution is low for success at an easy task or for failure at a difficult task. The person with high nAch desires high self-attribution of ability, so he prefers intermediate tasks.

It is apparent that this third hypothesis is in conflict with the first two. The first two hypotheses propose that persons with high nAch attribute both success and failure to effort rather than ability. The third suggests that these same persons prefer tasks of intermediate difficulty because the outcomes can be attributed to ability. Adding to this general confusion, Weiner and Kukla (1972) also assert (the fourth hypothesis) that people tend to attribute the outcomes of intermediate tasks to effort. They suggest that this results in increased motivation.

The basic problem with this attributional

analysis is that persons high in nAch attribute outcomes to ability as well as effort (a finding consonant with the association of high nAch and internal sense of control). Weiner and Kukla (1970) fail to demonstrate an empirical relationship between nAch and the dimension of stability. This dimension is used to explain the behavior of persons high in nAch, invoking effort attributions to explain high persistence and ability attributions to explain the preference for tasks of intermediate difficulty. No empirical data, however, support this alternation between effort and ability attributions. Furthermore, the ability attributions of persons with high nAch would result in decreased persistence. This is not disturbing, however, when one recalls that there is no consistent evidence associating nAch with either persistence or performance.

The utility of the Weiner and Kukla theory is its emphasis on information in explaining the preference for tasks of intermediate difficulty. That is, persons with high nAch can be said to prefer challenging tasks because the outcomes of these tasks yield information about one's performance capabilities. This implies that persons with high nAch prefer internal attributions, a suggestion which is supported by the positive relationship between nAch and internal sense control.

Information Analysis

An "information analysis" of the preference for challenging tasks characterizes the task as a tool whereby the individual measures his performance capacity. Tasks of intermediate difficulty provide the most precise delineation of the limits of performance. Consistent success (easy task, high (Ps)) allows that the individual might perform as well at more difficult tasks if he attempted them, whereas consistent failure (difficult task, low (Ps)) allows that the individual might perform better at easier tasks. This is simply the phenomenon of ceiling and floor in measurement. Tasks with a high (Ps) reveal that the individual would also succeed consistently at easier tasks, while tasks with a low (Ps) reveal that the individual would also fail at more difficult tasks. Neither reveals a limit. However, if (Ps) is about .50, then one can assume that the individual would both succeed more often at easier tasks and fail more often at more difficult tasks. Hence, his performance level has been located. The difference between a (Ps) of 1.00 or .00 and a (Ps) of .50 pertains to the quantity of information obtained about the individual's predicted (Ps) at tasks of other levels of difficulty than the task at which the known (Ps) was obtained. This relationship is illustrated in Figure 2.

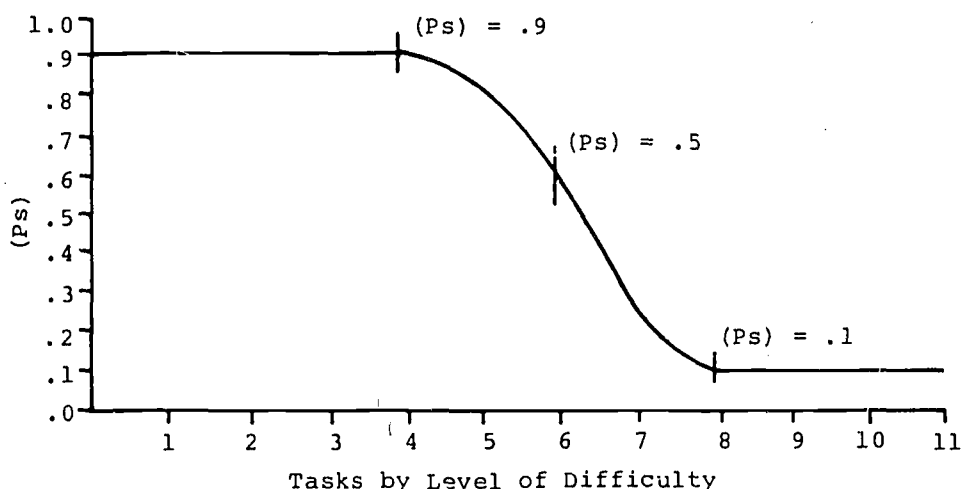


Figure 2. Performance curve for a single person, relating different probabilities of success, (Ps), to tasks of different levels of difficulty. (All tasks are within the same skill area.)

Minimal information is obtained at high and low (Ps) values:

(Ps) = .9 is constant over Tasks 1 to 4;

(Ps) = .1 is constant over Tasks 8 to 11.

Maximum information is obtained at intermediate (Ps) values:

(Ps) = .5 occurs only for Task 6.

(Chance is assumed to keep $.9 \geq (Ps) \geq .1$.)

This information analysis applies to the data underlying Weiner's third and fourth hypotheses. The major difference between the above interpretation and that of Weiner is that Weiner sees intermediate task outcomes as attributable to the individual while extreme (easy or difficult) task outcomes are attributable to task difficulty. The information analysis considers all outcomes attributable to the individual. Intermediate tasks attribute a more precisely delineated level of performance to the individual than do easy or difficult tasks. That is, intermediate tasks reveal more information.

What has been termed "information analysis" provides a consistent explanation of the behavior of persons high in nAch. Their preference for tasks of intermediate difficulty is seen as behavior which maximizes information on the individual's performance capacity (a product of ability and effort). Furthermore, this analysis could explain the contrary behavior of low-nAch individuals as a minimization of information on the individual's performance capacity.

This approach suggests a reconceptualization of the nature of (Ms) and (Mf). The need for success, (Ms), would be described in terms of a need for information on one's own performance capacity. The motive to avoid failure, (Mf), would reflect a desire to avoid information on one's own performance capacity. Whereas the conventional analysis refers to tendencies to approach success or avoid failure, the present analysis considers the approach and avoidance of information on one's own performance capacity. This eliminates the conceptual machinations necessary when trying to explain why a person who is "motivated to avoid failure" would prefer tasks where failure is most likely (low (Ps)).

Information analysis also explains why nAch scores relate to risk preference, but not to performance. Performance is always measured in terms of given tasks. If the difference between high- and low-nAch persons involves risk preferences, performance differences would only occur when the willingness to accept challenging tasks benefits performance. Even when molar measures of performance (e.g., grades) are compared, task selection is generally irrelevant. (At a given school the academic task is relatively uniform. In fact, the selection of easier courses by persons with low nAch would raise their GPAs.) As a sidelight, it is interesting to note that one experimenter (Peterson, 1971) found a correlation between achievement motivation and performance under conditions of maximum information feedback, but not with intermittent

feedback. A standard concept-learning task was used, such that performance was dependent upon the use of feedback on prior performance. This suggests that achievement-motivated persons may actually have a performance advantage when evaluative information is continuous and relevant to performance.

Social Comparison

The approach and avoidance of information on one's own performance capacity is essentially a process of social comparison. (Ps) represents the criterion for comparison. The person who is high in nAch prefers tasks with (Ps) = .50 because this allows the most accurate social comparison, which maximizes his information on his performance. For example, the task of adding two one-digit numbers measures performance of addition. If two children find that their (Ps) for this task is .50, then they know that their performance is equivalent on addition problems. However, if they both perform at a very high (Ps), say .85 or higher, then any difference between the two children on this task can be attributed to careless error (a chance attribution in Weiner's terms). The comparison becomes meaningless, because one child might understand long division while the other has just learned to add one-digit numbers. If the second child never attempts any tasks except the addition of one-digit numbers, he precludes any comparative distinction between himself and the first child. The same principles of comparison would apply if the two children could compare themselves only in terms of algebraic tasks (low (Ps)). That is, no differences in mathematical performance would be revealed by such difficult tasks. The social comparison function of task information is illustrated in Figure 3.

The application of social comparison processes to the information interpretation of risk preferences facilitates the explanation of data which violate the McClelland and Atkinson nAch model. This model hypothesizes an inverse relationship between (Ps) and (Is), such that the tendency to engage in an activity, (Ta), is mathematically maximized at (Ps) = .5. However, Klinger and McNelly (1969), reviewing the literature, conclude that persons high in nAch prefer tasks where (Ps) = .3, while persons with low nAch prefer (Ps) = .1 or (Ps) = .7. Assuming these data are correct, the conventional model would not distinguish between moderate- and low-risk performances (.3 and .7, respectively) because both would yield the same (Ta). However, an information analysis which incorporates

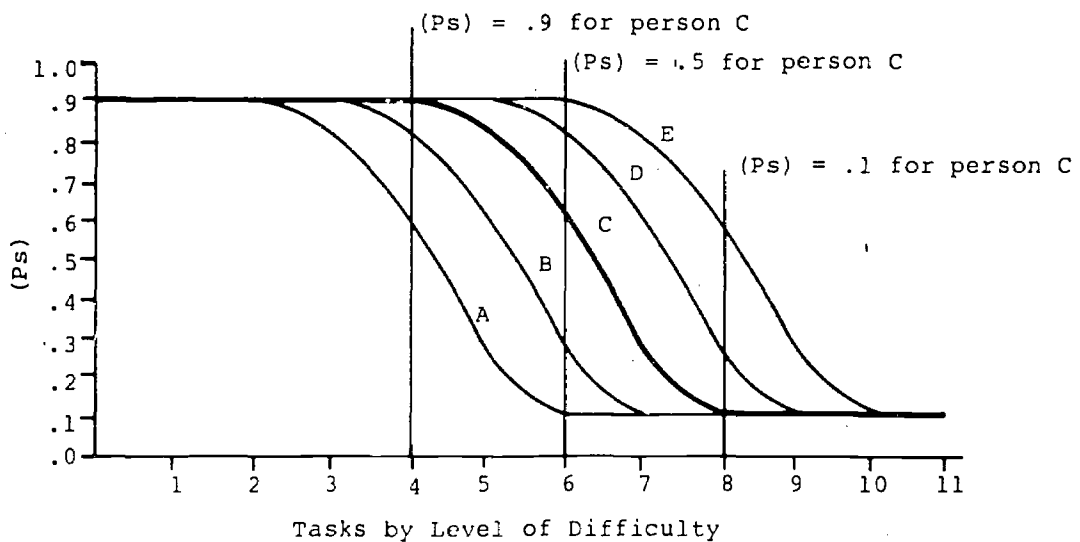


Figure 3. Performance curves for persons A, B, C, D, and E, representing the information provided to person C through comparison with persons A, B, D, and E.

Minimal information is obtained at high and low (Ps) values:

Comparison in terms of Task 4 tells person C that he is more capable than persons A and B;

Comparison in terms of Task 8 tells person C that he is less capable than persons D and E.

Maximum information is obtained at intermediate (Ps) values:

Comparison in terms of Task 6 tells person C that he is more capable than persons A and B and less capable than persons D and E.

(Chance is assumed to keep $.9 \geq (Ps) \geq .1$.)

social comparison depends upon relative levels of (Ps), rather than absolute levels. If (Ps) = .7 is the lowest level of difficulty that people generally attempt (as Klinger and McNelly imply), then persons selecting tasks where (Ps) = .7 would minimize information based on social comparison. This is because there would be no persons attaining a higher level of success to which the individual could compare himself. Likewise, (Ps) = .3 would provide maximal information in terms of social comparison because .3 would be the intermediate level of success that people exhibit, allowing comparisons with persons at higher and lower levels of (Ps).

The process described here is related to the process of social comparison analyzed by Festinger (1954). The basic hypothesis of Festinger's theory of social comparison is that people will compare themselves with someone similar to themselves rather than someone divergent in opinion and ability. Festinger reasons that sharply divergent comparisons make precise evaluation impossible. Whereas Festinger is concerned with the person one compares himself

to, the information analysis presented here focuses on the task in terms of which the comparison is made. However, both theories assume that people gather information about themselves by comparing themselves with others. When related to Festinger's theory, the most important implication of information analysis is the suggestion that people sometimes seek to avoid information. Festinger hypothesizes a human drive to evaluate opinions and abilities; this would imply that people should always seek to maximize the information pertaining to their abilities. We have seen, however, that this is not confirmed by an analysis of the information sought through selection of tasks. People sometimes avoid behavior which would allow informative comparisons in terms of performance. (The word performance is preferred to abilities because performance can be operationally defined in terms of task outcomes, whereas the effects of ability and effort cannot be objectively separated.)

Singer's (1966) critique of Festinger explains why people might sometimes avoid comparative

information. He contends that people sometimes avoid an informative comparison that might be detrimental to their self-esteem. The selection of tasks which preclude meaningful comparisons of performance (due to very high or low (Ps)) would be one means of avoiding a potentially aversive comparison. It should be noted that this prevents both the individual himself and anyone else from obtaining the information that performance on a challenging task would provide.

Hakmiller (1966) reports data supporting the hypothesis that people sometimes avoid informative comparisons that threaten their self-esteem. Female college students were tested for "hostility toward one's parents." Ss were given their own scores in terms of numerical value and rank order in a group of five. Knowing this, each S was asked which one other score of the five she wanted to know. A high-threat condition was established by describing the "hostility toward one's parents" variable in negative terms. Low threat was established with a positive description of the hostility variable. Ss in the high-threat condition were significantly more likely to seek comparison with the most discrepantly hostile individual out of the five. That is, a less informative comparison (by Festinger's similarity criterion) was selected as a means of avoiding information of potential detriment to self-esteem.

In summary, nAch is consistently related to risk preferences, but not to performance. The present discussion proposes that risk preferences are dependent upon the individual's desire to obtain information about his own performance. Moderate risks are shown to offer maximum information. The relative preference of high-nAch individuals for moderate risks is attributed to a need for information and evaluation of self. The relative avoidance of moderate risks exhibited by low-nAch individuals is attributed to a perception of self-evaluation as threatening to self-esteem. Hence, "need Achievement" should be reconceptualized as the willingness to seek information about one's own performance capacity.

The failure of nAch to predict long-term individual performance can be attributed to the instability of nAch as a personality trait. However, nAch does predict risk preference at a given moment; it is a reliable situational predictor of the preference for challenging tasks. It is logical to assume that the consistent selection of challenging tasks (moderate risk) will maximize skill development. Therefore, if environmental conditions can be established which maximize the preference for challenging tasks, skill development (performance) should benefit from those conditions. Performance is

reliably associated with nAch scores across cultures (McClelland, 1961) and social classes (Klinger & McNelly, 1969), though not across individuals (Klinger, 1966; Maehr & Sjogren, 1971). Therefore, environmental conditions manifest the relationship between nAch and performance which is not found for personalities. The following discussion of educational policy shall assume that environments which enhance nAch also facilitate long-term skill development (performance) as a function of preference for challenging tasks.

Educational Application: The Maximization of Preference for Challenging Academic Tasks

The present analysis of achievement motivation suggests that challenging tasks are "preferred risks" when the accurate evaluation of performance is desired. The avoidance of challenging tasks has been attributed to perceived threats to self-esteem. Therefore, educational environments can maximize student preference for challenging tasks by minimizing student perception of performance evaluation as threatening to self-esteem. This does not imply that evaluation should be eliminated. Social comparison theory (Festinger, 1954; Singer, 1966) suggests that people seek information through comparison of themselves with others, except when the information is perceived as potentially detrimental to self-esteem. This indicates that students will actively seek challenging tasks as sources of information so long as that information is not concealed and is nonthreatening.

The foregoing theory suggests the following educational strategy. Instruction should be individualized so that each student is engaged in a task which "challenges" his ability. That is, students should work at tasks where they have an intermediate probability of success. (The optimal level could be determined empirically.) This requires frequent evaluation of performance. When a student's probability of success becomes too high he should advance to a slightly more difficult task. In this fashion the student will never engage in a task that deviates far from the moderate probability of success level. This does not require that a student leave a subject-matter area before he has mastered it well beyond the intermediate level. However, it does require that the student work on subsets of the tasks in each subject-matter area, those subsets being determined by the moderate (Ps) criterion. For example, a child learning addition would work on and be tested on problems at the intermediate (Ps) level.

Increments would be devised so that moderate success at one level assures high probabilities of success at all lower levels. That is, if the student can add six one-digit numbers correctly half the time, it may be assumed that he could add two one-digit numbers without error on as many as 90% of all trials. However, this student would not have practiced adding two one-digit numbers after he had demonstrated success beyond the intermediate level.

This system does not establish a preference for challenging tasks. It requires performance on challenging tasks. In the ideal situation tasks would be set up so that (Ps) would always fall within a defined range. Performance at the upper limit of that range would require advancement to a more difficult task level, but not so much more difficult that the student would start out at a (Ps) below the defined range. Of course, this ideal often would be violated because of factors such as measurement error. Nevertheless, the student essentially would be required to work on "challenging" tasks.

Threats to self-esteem would be minimized by comparing students primarily to their equals. Scores on a given test could never diverge greatly because students would never be tested at a task much above or below the intermediate performance level. Furthermore, instructional grouping would insure that all students in a given group would work on the same task. In this way an individual would always have a learning reference group of equals in terms of performance. The use of open schools (in the physical sense) would minimize labeling of performance levels, maximize instructional flexibility, and insure that every student (except the youngest) would be conscious of the fact that he was performing at a higher level than some other students. This last point, the provision of favorable social comparison referents for virtually all students, provides a self-esteem defense that students can always fall back on.

One final strategy would be to maximize the generalizability of social comparison groups. That is, class populations should be representative of the real world. Only then can the student generalize the evaluative information that he gains in school to the outside world. This enhances the value of information obtained by attempting challenging academic tasks. The

most important policy implication of this strategy would be the integration of classes in terms of racial and economic groups. Coleman et al. (1966) found that classroom integration is associated with improved academic performance on the part of black students, while white students maintain their level of performance. This relation holds so long as white students are represented as the majority. Poussaint and Atkinson (1968) attributed this finding to the approximation of the real world in terms of racial representation. They argue that this "suggests to them [blacks] that they can cope in any situation, not just one in which they are interacting with others who have been defined as inferior" (p. 247). That is, social comparison information gained in class on the ability to cope becomes generalizable to the real world.

It is clear, then, that a reanalysis of nAch in terms of a need for information bears strong implications for educational practice. The underlying precept is that students will seek challenging tasks as sources of information on their own performance capacities so long as that information does not threaten their self-esteem. This suggests that individualization and small, homogeneous instructional groups should enhance motivation by minimizing threatening performance comparisons. In addition, individual or small-group instruction makes it possible to keep each student working on tasks that challenge his abilities. Information analysis of nAch also suggests that classes should be integrated so that student populations are representative of the real world. This maximizes the generality of the information that the student gains from his relative academic performance.

Further research is necessary to identify additional situational variables that can be manipulated to minimize academic threats to self-esteem. It is likely that the form and manner of feedback on performance are highly relevant here. That is, feedback can be normative or non-normative. It may be presented publicly or privately. Considerations such as these may be crucial to the student's willingness to seek information on his academic performance. That attitude toward information is, in turn, crucial to the student's acceptance of educational challenge.

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